California Interagency Working Group on Indoor Air Quality

Meeting Minutes

December 8, 1999
Elihu Harris State Office Building
1515 Clay Street, Oakland, CA

GENERAL ANNOUNCEMENTS

SPECIAL PRESENTATION

AGENCY REPORTS ON CURRENT IAQ ACTIVITIES

California Air Resources Board / IAQ & Personal Exposure Assessment Program
California Department of Health Service / Environmental Health Investigations Branch
California Department of Health Service / Indoor Air Quality Section
California Department of Health Service / Occupational Health Branch
California Department of Health Service / Tobacco Control Section
California Department of Industrial Relations (Cal/OSHA)
Lawrence Berkeley National Laboratory / Indoor Environments Program
Office of Environmental Health Hazard Assessment / Indoor Air Risk Assessment Group
U.S. EPA Region IX / Indoor Environment Team

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GENERAL ANNOUNCEMENTS

General Accounting Office Report on IAQ. The U.S. GAO issued its report *Indoor Pollution: Status of Federal Research Activities,* GAO/RCED-99-254 (84 pages) on August 31, 1999. The report reviews federal programs addressing IAQ. It found that federal agencies report that they spent nearly $1.1 billion on indoor pollution research from 1987 through 1999. Research by the federal government and others has led to notable progress in understanding indoor pollution and in devising ways to mitigate the problem. Consumer products have been reformulated, and building materials and practices have been changed. However, many gaps in understanding the problem remain, including uncertainties about (1) the identity and the sources of pollutants; (2) the mechanisms by which people are exposed to them; (3) the health effects resulting from prolonged and intermittent exposure to low-level concentrations of chemical and biological pollutants as well as complex pollutant mixtures; and (4) the most cost-effective strategies for reducing pollutant sources, exposures, and consequent health effects. Ordering and report information can be found on-line at http://www.gao.gov/monthly.list/aug99/aug999.htm

National Academy of Sciences Report on Asthma and IAQ. *Late Breaking!* Funded by U.S. EPA, NAS' Institute of Medicine just issued an important report, *Clearing the Air: Asthma and Indoor Air Exposures* , on the role of indoor environmental pollutants in the development and exacerbation of asthma. The report concludes that exposure to indoor pollutants is an important contributor to the asthma problem in this nation, and it support the Administration's initiative to increase awareness of the impact of indoor air pollutants on asthma exacerbation & development, and to increase the use of effective indoor environmental interventions. The NAS press release is at http://www4.nationalacademies.org/news.nsf/isbn/0309064961?OpenDocument, the executive summary can be found at: http://www.nap.edu/html/asthma/summary.pdf, and the EPA asthma web-site is at www.epa.gov/iaq/asthma.html.

***Green* Building Practices: An Architectural Perspective.** Plan to attend an upcoming seminar by two leading professionals in the architectural field, March 7, 2000, 1:30 to 3:30 pm in Sacramento (Community College Executive Board Room, 1102 Q Street, 3rd Fl). There will be two talks:

- *Approach to "Green" Building: Strategies and Materials* by Anthony Bernheim, FAIA, Principal, SMWM, San Francisco, CA

  and

- *Beyond Current Practice in "Green" Building Design and Construction,* by Hal Levin, Research Architect, Building Ecology Research Group, Santa Cruz, CA

International Society of Exposure Analysis Conference in Monterey. The ISEA will hold its annual conference October 24-27, 2000 at the Asilomar Conference Center. Conference co-chairs are Tom McKone (TEMcKone@lbl.gov) and Jed Waldman (JWaldman@dhs.ca.gov). Abstracts for papers are due mid-April. Conference information can be found on-line at the web site: http://www.iseaweb.org/isea2000.html.

Seminar on IAQ and Performance in Schools. Lisa Heschong, Partner, Heschong & Mahone Group (http://www.h-m-g.com) will give a seminar on ***Studies of Human Performance and the Indoor Environment: Effects of Daylighting in Schools and Retail Sites.*** This talk will address the application of epi-style study design and methods to human performance outcomes. These unique studies quantify the influence of environmental factors, notably daylight as an illumination source, on student test scores and on retail sales. Linear regression analyses were used to control for other influences on performance. Study reports are available on-line at the PG&E web site: http://www.pge.com/pec/daylight/valid4.html. The seminar will be on February 15, 2000 (Tuesday), 10 am to 11:30 am,in the Auditorium, DHS Laboratory Facility, 2151 Berkeley Way, Berkeley.

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SPECIAL PRESENTATION

Ed Faeder, Ph.D., toxicologist for the Saugus Union School District described their IAQ studies and results for portable (and permanent) classrooms and district's IAQ policies for ensuring healthy schools. Information about district activities, including reports on their IAQ studies, can be found on-line at: http://www.saugus.k12.ca.us/environ/env2.htm.

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AGENCY REPORTS ON CURRENT IAQ ACTIVITIES

California Air Resources Board / Indoor Air Quality & Personal Exposure Assessment Program http://www.arb.ca.gov/research/indoor/indoor.htm

- Peggy Jenkins (*mjenkins@arb.ca.gov*)

ARB Symposium on Indoor Air Quality. ARB is sponsoring a symposium, entitled *Indoor Air Quality: Risk Reduction in the 21st Century*, on May 3-4 at the Doubletree Hotel in Sacramento, The symposium will feature scientists and decisionmakers discussing the risks from indoor pollution in California and actions needed to reduce those risks. The public is invited, and extended question/answer/discussion sessions are planned. First announcements will be mailed in late January. Contact: Peggy Jenkins, mjenkins@arb.ca.gov

New journal article on an ozone generator. The journal article by ARB staff, "Ozone emissions from a 'personal air purifier'," has been published in the *Journal of Exposure Analysis and Environmental Epidemiology*, November/December 1999 issue (info on the journal as available on-line at http://www.stockton-press.co.uk/jea/). Ozone levels measured 1 to 6 inches above small consumer devices advertised as air purifiers exceeded various types of health-based standard levels set by the U.S. FDA and OSHA and the California ARB. Contact: Tom Phillips, tphillip@arb.ca.gov.

Input on green building projects. ARB's Indoor Program staff recommended performance specifications and reviewed the submitted bids for carpet for the new Cal/EPA building for potential impacts on indoor air quality. As part of the Sustainable Building Committee for the DGS Capitol East End office building project, staff reviewed and rated the proposals submitted to

DGS for the East End project. Staff also has participated in discussions regarding potential development of a State Green Building Task Force that would assist DGS in developing specifications for different types of buildings in different climate zones to assure healthful indoor air quality and the efficient use and protection of resources. Contacts: Steve Hui, shui@arb.ca.gov, Dorothy Shimer, dshimer@arb.ca.gov.

Havice Hearings on School Indoor Environmental Quality. Representatives from ARB, DHS, Dept. of Education, and other state agencies participated in interim hearings on school indoor air quality sponsored by Assemblywoman Havice, Chair of the Assembly Select Committee on School Safety. School consultants, US EPA Region 9, and others testified at the hearing as well. ARB noted that there are few standards that directly apply in schools; notably, building material emission standards are lacking. DHS and others noted the need for ventilation, moisture control, and proper operation and maintenance of both traditional and portable classrooms. Assemblywoman Havice was the only legislator attending the Sacramento hearing, although staff of other members also attended, and one other committee member attended the southern California hearing. Contact: Peggy Jenkins.

Underwriters Laboratory Standard 2117, for indoor products. UL's General Standards workgroup met in the last quarter; ARB participated by conference phone. The group continues to work in a circular fashion, re-visiting issues previously decided upon. UL management has recognized the need for progress by the General Standards workgroup, and actively participated in this meeting. However, success is not likely until appropriate operating rules are identified and followed by members. The General Standards workgroup and UL's overall Technical Committee for the standard are scheduled to meet in February in Florida. Contact: Peggy Jenkins.

Responses to various public and agency information requests. Citizens, local government representatives, the Department of Personnel Administration, and the Governor's Office requested recommendations on protective measures and/or indoor air cleaning devices during northern California forest fires and the Modesto tire fire this past fall. ARB, other Cal/EPA agencies, and DHS all provided various types of assistance and advice. The South Coast Air Quality Management District requested information on indoor pollutant levels and test methods to assist them in monitoring and planning major airport expansions, which will involve home tightening for noise insulation. The Department of Toxic Substances Control requested indoor VOC data to help evaluate measurements in a home near McClellan Air Force Base in Sacramento. Contact: Peggy Jenkins or Tom Phillips.

News of General Interest. The California Regional Residential Building Science Training will be at San Ramon, January 25-26. Affordable Comfort, Inc. is organizing the event, which will train building professionals and those in allied trades on "house as a system" thinking, which is being promoted through recent CEC building standard revisions. Topics will include practical ways to prevent or solve problems, comfort complaints, and CO alarm calls. Contact: Helen Perrine, *Affordable Comfort*, 800-344-4866x15, or on-line at the web site: http://www.affordablecomfort.org/html/caEvent.html.

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California Department of Health Service / Environmental Health Investigations Branch

B Sandra McNeel (SMcNeel@dhs.ca.gov)

Tire Fire Advisory. Sharon Seidel, PhD, staff toxicologist, worked with personnel from OEHHA and DTSC's Hazardous Materials Laboratory to provide technical support to Stanislaus County health officials regarding potential health effects from the Westley tire fire. This fire involved a pile of approximately 7 million tires and burned for 34 days. County health officials published a health advisory recommending that persons susceptible to upper respiratory irritation (those with asthma, chronic bronchitis, emphysema, coronary heart disease, etc.) shelter-in-place. Dr. Seidel suggested to the Indoor Air Quality Interagency Working Group that additional study of the effectiveness of shelter-in-place recommendations is needed to more clearly define how protective this action is. Contact: Sharon Seidel, SSeidel@dhs.ca.gov)

School Health. EHIB personnel continue to provide technical consultation to schools and individuals with health concerns regarding a variety of environmental agents, including indoor molds and chemical contaminants either on school sites or from adjacent properties. Debra Gilliss, MD, MPH, is currently working with other state agencies to address concerns regarding cancer cases allegedly associated with emissions from landfills next to two schools in southern California. (Contact: Debra Gilliss, DGilliss@dhs.ca.gov)

Staff Presentations:

- Sandra McNeel, DVM, presented information on potential health effects in children from moisture and indoor mold growth at a conference in Los Angeles on October 21, 1999. This meeting, "Unhealthy Homes are Scary Places for Children", was sponsored by the Los Angeles County Department of Health Services' Childhood Lead Poisoning Prevention Community Health Advisory Council. Attendees included county health agency personnel, private industrial hygienists, school officials, members of the general public and public housing advocates. This provided an opportunity to introduce the topic of biological contaminants and their effects on respiratory health and asthma to a broad range of public health officials and community housing activists.
- Dr. Gilliss gave a presentation on epidemiology methods and environmental contaminant sources to California Department of Education site inspection staff.
- Dr. Gilliss represented the California Department of Health Services (CDHS) at two public hearings sponsored by Assemblyperson Sally Havice, Chair of the Assembly Select Committee on School Safety. Dr. Gilliss gave testimony regarding CDHS's involvement in promoting health and safety in and around public schools and day care facilities. Although the hearing was called to address concerns raised about portable classrooms specifically, CDHS urged that attention be directed to all classrooms, both permanent and portable. While acknowledging a lack of information on the full extent of classroom environmental problems in California, key issues that continually reappear regarding school classrooms are: poor ventilation effectiveness, chemical exposures and odors, tight building construction, water leaks and mold contamination, and poor siting of portables. The department recommends that all schools establish guidelines and design review for key classroom elements such as ventilation and chemical emissions, promote maintenance practices that ensure healthy schools, and develop or adopt guidance on "best management practices" for responding to

health complaints from staff or students (e.g., US EPA's Indoor Air Quality Tools for Schools program).

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California Department of Health Service / Indoor Air Quality Section

http://www.cal-iaq.org

B Jed Waldman (JWaldman@dhs.ca.gov)

New E-mail Addresses. Finally, the DHS IAQ group have been connected to the Department's LAN. This means that we all can now receive e-mail attachments at the state address. The addresses use the format: FLastnam@dhs.ca.gov, that is, combine first initial and last name (up to 8 letters) at the dhs domain.

Sierra Region Radon Survey. A survey of radon exposure in the Sierra region of California was started this fall. Alpha track radon detectors were sent to 1000 residences, recruited from a population-based random mailing using DMV registration records in 14 counties. Detectors will be left in place for 12 months, to determine long-term residential exposures. A subset of public elementary schools in these counties has also been recruited for classroom measurements of radon concentrations. Funding is being provided by a U.S. EPA State Indoor Radon Grant, and IAQS is working in collaboration with the DHS Radon Program in the Division of Drinking Water and Emergency Management. (Contact: Kai-Shen Liu, KLiu@dhs.ca.gov and Feng Tsai, FTsai@dhs.ca.gov)

ETS. After a delay of a few months due to some difficulties with the LBNL subcontract, the study will start in January. We will start with comparing two real-time instruments for measuring particle phase of ETS. A detailed protocol has been developed for this comparison study. A full-time Research Associate has been hired to assist us with the entire study. In addition, a manuscript entitled *A Survey of Environmental Tobacco Smoke Controls in California Office Buildings* was submitted for review to *Indoor Air*. The authors are Kai-Shen Liu, Leon Alevantis and Francis Offermann. (Contact: Leon Alevantis, LAlevantis@dhs.ca.gov)

Collaboration on study of Lead in Homes. IEQ staff provided statistical consultation in the chamber evaluation of vacuum cleaners in the removal of lead dust conducted by Steve Wall, DHS Outdoor Air Quality Section Chief. Completion of the initial chamber experiments allowed selection of vacuum cleaners to be used in a field project funded by U.S. Housing and Urban Development, Office of Lead Hazard. (Contact: Kai-Shen Liu)

Unintentional Carbon Monoxide Death Study. The manuscript entitled Unintentional Carbon Monoxide Deaths in California from Residential and Other Nonvehicular Sources, has been accepted for publication by the Archives of Environmental Health. The authors are Kai-Shen Liu, Katrina Paz, Peter Flessel, and Jed Waldman of the DHS-IAQ Program, and John Girman (U.S. EPA/IED). In addition, Kai-Shen Liu presented the results of the California study at a public hearing held by the San Francisco Public Health and Environmental Committee in January 2000. (Contact: Kai-Shen Liu)

Continuing Activities on Pesticide Exposure Study. Janet Macher is continuting work on *Community Partnership for Evaluating and Preventing Pesticide Exposures to Young Children*. Prinatal home visits were started, as well as collection of Burkard samples at a community site in Salinas. SOPs and QA/QC for bioaerosol/aeroallergen samples were reviewed. (Contact: Janet Macher, JMacher@dhs.ca.gov)

PM Study Likely to Start. Janet is co-investigator on a new proposal submitted and approved by CARB: *Responses to Short-term Fluctuations in Particulate Air Pollution in Asthmatic Children: Implications for Asthma Natural History, Part B: Characterization of Asthmatic Children's Air Pollution Exposure in Fresno, California.*

Presentations and Committees.

- Kai-Shen Liu attended the U.S.EPA's Science Advisory Board meeting to review the Total Risk Integrated Methodology, as a member of the Environmental Models Subcommittee.
- Janet Macher gave presentation on *Biological Assessment and Control* at the California Environmental Health Association and the California Industrial Hygiene Council.

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California Department of Health Service / Occupational Health Branch

http://www.ohb.gov

Jim Cone (Jcone@ohb.org) and Liz Katz (Ekatz@dhs.ca.gov)

Occupational Exposure to Diesel Exhaust. The identification of diesel exhaust as a carcinogenic mixture has greatly increased interest in the identification and control of occupational exposures. HESIS is planning to develop appropriate educational materials for workers. We are currently obtaining current information about exposed workers in California, exposure levels, control or substitution options, and activities of other agencies. Firefighters are routinely exposed to diesel exhaust from their trucks running inside fire stations. In response to their interest, HESIS has begun running monthly articles in the newsletter of the International Association of Firefighters, Local 798, concerning diesel as well as other occupational health issues. Also, in response to a request, HESIS attended an informational meeting with two members of Assemblywoman Gloria Romero's staff regarding diesel exhaust and its effect on firefighters. The Firefighters Union intends to request a Health Hazard Evaluation from NIOSH.

Hexane use by Vehicle Mechanics. Serious nerve damage (peripheral neuropathy) was found in two Bay Area auto mechanics who were using brake cleaners containing n-hexane. Although n-hexane has long been known as a neurotoxin, this is a newly recognized occupational hazard for mechanics. HESIS has responded with several surveys to determine the extent of exposure; notifications to product manufacturers, industry groups, and labor organizations; and a worker education fact sheet (in development). A pilot study is underway to determine the extent of undiagnosed disease in workers using these products.

Wildfire Smoke - Protective Measures. HESIS provided technical assistance to the US Forest Service regarding protective measures for a large number of California workers exposed to smoke from an ongoing forest fire. "Indoor" areas in temporary structures for work and housing were affected, as well as outdoor areas. Our recommendations addressed respiratory protection,

exposure reduction, medical removal of at-risk workers, employee education / hazard communication, and related regulatory issues.

Theatrical Fog and Smoke. Responding to complaints from opera employees, HESIS investigated the occupational health impact of several products used in theatrical settings. We concluded that adverse health effects among employees of the theater, including asthma, upper respiratory / mucous membrane irritation and headaches, were likely due to artificial fog products and smoke from propane torches used during productions. Recommendations addressed substitution of products, prior notice to employees, obtaining Material Safety Data Sheets, and ventilation.

IAQ Inquiries. HESIS continues to receive calls from California workers, employers, and agencies regarding IAQ in the workplace. We offer phone consultation and referrals. Callers with occupational IAQ concerns should be referred to our 24-hour message line, 510-622-4317. Please do not refer residence-related calls.

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California Department of Health Service / Tobacco Control Section

B Paul Hunting (Phunting@dhs.ca.gov)

Meeting on Secondhand Smoke Exposures. The DHS Tobacco Control Section hosted "Clearing the Air in the New Millennium" in San Diego on Sept. 23-24, 1999. Over 250 education and law enforcement professionals attended this meeting, which examined past success, current challenges and future directions regarding secondhand smoke, as well as issues related to secondhand smoke and exposure in areas not previously covered by the Labor Code. Presentations were made by program professionals directly involved with California projects as well as several guest speakers. Special guests included **Jennifer Jinot**, a researcher and secondhand smoke specialist with the U.S. EPA, who discussed the science of secondhand smoke and exposure to children. The keynote for Day One was the State Attorney General, **Bill Lockyer** who spoke on the need for increased partnership between law enforcement and public health. Day Two feature a closing address by CDHS Director, **Dr. Diana Bontá.** Dr. Bontá spoke passionately about the need to protect workers from secondhand smoke exposure and the need to maintain local vigilance on the education and enforcement front.

The conference served as a starting point for new secondhand smoke initiatives in additional shared spaces. Several presentations highlighted local efforts to enact voluntary policies and local ordinances to make hotels, nursing homes, apartment complexes, condominiums, dorms, playgrounds, parks, doorways, and college campuses, smoke-free. The conference also served as a kick-off for a new ad directed at enhancing compliance with smoke-free bars. Although it was still in "rough-cut" form, it promises to have a strong impact.

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California Department of Industrial Relations (Cal/OSHA)

http://www.dir.ca.gov/DIR/OS&H/DOSH/dosh1.html

B Jim Lim (Jlim@hq.dir.ca.gov)

Asbestos Training Approval Program. The Division has hired two new Associate Industrial Hygienists and a new clerk to implement a program to approve asbestos training based on regulations that became effective on January 2, 1999. The new program will approve AHERA and other asbestos training courses which are required in existing Cal OSHA Title 8 regulations. The program will also establish and maintain a roster listing trained individuals validated by the Division. The aim of the new program is to assure high quality trained individuals for working with asbestos, and to eliminate fraudulent asbestos training certificates which are presently in use. This new program is presently operational and is receiving requests from training providers for approval of their asbestos training courses. The program will be entirely supported by fees that will be collected by the program.

Airborne Contaminants 8 CCR 5155. After completing a series of ad hoc advisory committee meetings on the subject, the Division has completed a proposal to update the PELs of 8 CCR 5155. The proposal has been transmitted to the Standards Board for their consideration and adoption.

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Lawrence Berkeley National Laboratory / Indoor Environments Program

B Mike Apte (MGApte@lbl.gov)

The IED is involved in a wide array of ongoing research projects relating to IAQ. A summary of projects is attached with staff contacts (Go to Attachment). Program information is also available at the web site: http://eetd.lbl.gov/iep/iep.html

The CIWG-IAQ members join with LBNL-IED staff in sending our best wishes to Joan Daisey for her speedy recovery.

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Office of Environmental Health Hazard Assessment / Indoor Air Risk Assessment Group

http://www.oehha.org/

B Richard Lam (*RLam@oehha.ca.gov*)

Uncommon indoor contaminants. OEHHA responded to a number of calls in the past six months from the public and other agencies concerning indoor contaminants and among them are a number of unusual indoor contaminants:

- Bromobenzene. Request for health information from the U.S. Customs, Investigative Branch, on bromobenzene in a home used as a drug lab; bromobenzene is used to crystallize out PCP.
- Methyl bromide. Complaints from nursery personnel due to exposure from methyl bromide used to fumigate soil in greenhouse.
- 2,4-D. The emergent herbicide, 2,4-D (Weed-N-Feed), was brought into home by children and dog playing on newly-applied lawn.

- Asphalt fumes. Office workers reported various health symptoms from an overheated fluorescent ballast containing melted asphalt.

Proposition 65. For the first time since its approval by the California voters 13 years ago, Prop 65 has been amended. On Oct 6, Governor Davis signed SB 1269, which requires the tracking of lawsuits and settlements. The amendments gives the Attorney General greater control over Prop 65's enforcement process by ensuring that he is aware of all Prop 65 lawsuits filed throughout the state. Results of settlements (including financial terms), judgments, or dismissals of Prop 65 cases are now available to the public. The on-line address is www.oehha.ca.gov/prop65/.

Children's Environmental Health Protection (SB 25). SB 25, the Children's Environmental Health Protection, was signed by Governor Davis. It requires OEHHA and ARB to do 7 tasks:

- establish the Children's Environmental Health Center
- expand air monitoring in 6 communities, near schools and areas where children are present
- review and revise health-based ambient air quality standards for criteria air pollutants taking into consideration the sensitivities of infants and children
- develop and update a list of toxic air contaminants (TACs) that may impact children
- review prioritize TACs and established threshold and nonthreshold health values
- review and revised affected air toxic control measures to ensure that they protect infants and children, and
- prepare needs assessment reports for the TACs and adopted appropriate control measures.

A two-day symposium on this topic will be held on May 1-2, 2000.

Study of Portable Classroom Ventilation. As part of a class project, Kathleen Vork (Kvork@oehha.ca.gov with Neil Klepeis (nklepeis@uclink4.berkeley.edu), conducted a pilot investigation of ventilation in a number of portable classrooms. Facilities personnel and teachers in Oakland and Fremont were interviewed. A report of this will be available in the future.

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U.S. EPA Region IX / Indoor Environment Team

http://www.epa.gov/oar/oria_ied.html

B Barbara Spark (spark.barbara@epamail.epa.gov)

Guidelines for School Construction. Bob Thompson at IED (EPA HQ) is developing guidelines for school construction and renovation. To provide input, particularly in light of current interest in IAQ in relocatable classrooms, we organized a "mini-summit" on school construction including manufacturers and state agencies in Sacramento on November 15, 1999. This meeting provided an opportunity to jump-start dialogue between EPA, state and industry stakeholders, as the first step in a wider process to be determined. At the meeting, industry expressed the desire to work with government to extend opportunities for school districts to receive credible IAQ training from authoritative sources. Minutes were distributed to attendees. (Contact: Shelly Rosenblum, Rosenblum.Shelly@epa.gov)

Indoor Air Quality Tools for Schools (TFS): We provided orientation training on the IAQ TFS Action Kit program for the Beverly Hills USD, to kick off its formal implementation at all (five)

of its schools. BHUSD experienced a situation similar to that in the Saugus Union SD after media coverage of "toxic portable classrooms" heightened community concerns.

Our primary TFS activities continue to focus on the Oakland and San Francisco USD's, chosen because they are large urban school districts where logistics make it possible for our tiny Indoor Environments Team to have extended hands-on involvement. Since the fear of the unknown is one barrier to IAQ program implementation in schools, we feel that "pilot" schools can demonstrate that a school IAQ operations and management program is beneficial, and not onorous. TFS implementation is being rolled out at a few Oakland schools, without a pronounced district administrative engagement in the process. EPA staff are leading Oakland "pilot schools" on "walk-throughs"of their facilities. In SFUSD, we are working closely with the District at a number of levels, including participating in its "IAQ Program Implementation Committee," which is in the process of launching approximately fourteen IAQ TFS "pilot" sites. This exciting and innovative process, supported by upper management, is bringing together diverse district elements such as the Health Program, Facilities, and the teachers' union which typically do not communicate on issues like IAQ. (Contact: Louise Hill, Hill.Louise@epa.gov)

School IAQ "Mentor" Program. We are working with the ALA of San Francisco and San Mateo Counties to support their interest in providing administrative support for organizing the much-needed IAQ TFS "Mentor" program, an idea developed with the local AIHA chapter, but which has been delayed by the absence of administrative and organizing oversight. The major surge in interest in IAQ by school districts, coupled with current successes in launching "pilot" schools, has created a pressing need for "Mentors" who can facilitate schools' transition to a new paradigm on IAQ - that addressing it is everybody's business, and there is much that non-technical people can accomplish by using the IAQ TFS Action Kit.

Offering Mentors to individual schools can help them overcome the fear of the unknown - dealing with IAQ. This Mentor program has already been successfully piloted in LA County, and is being replicated in Arizona by the American Indoor Air Quality Council and ALA. The amount of effort required from Mentors is reasonable, and great benefit will redound to the community and to awareness of IAQ issues in the state. Our prior request to IAWG for volunteer mentors elicited almost no response. *Please consider stepping forward to help advance real-life program implementation of IAQ science.* (Contact: Shelly Rosenblum)

Presentations.

- Havice Hearings. Barbara Spark testified on EPA's "building systems approach" to IAQ at the November 5, 1999 Sacramento hearing called by Assemblywoman Sally Havice. She was interviewed by a reporter for CBS radio news, in a report played in the Bay Area and an unknown number of other markets.
- Modular Buildings: Barbara Spark spoke on school IAQ at the Winter Conference of the Modular Building Institute in Ontario, CA Nov. 19.

Asthma. IED has created a new brochure, *Clear Your Home of Asthma Triggers: Your Children Will Breathe Easier.* [EPA/402-F-99-005, July 1999]. Individual copies are available from IAQ INFO, (800) 438-4318. It's viewable in on-line at http://www.epa.gov/iaq/asthma.html. Finally,

staff is participating in the CA workgroup developing the state asthma strategy on Public Education.

We still await word from HQ as to the availability of FY2000 fund to expand asthma-related activities. However, it is probable that we will be hosting an "HMO Summit" on asthma and indoor environments. We also expect to provide a two-day workshop on maintaining "Asthma-friendly" indoor environments via our training center, the University of Tulsa.

Radon in Drinking Water Standard. The proposed standard for radon in drinking water has been released, comment period ends February 4, 2000. The proposal provides states flexibility in how to limit the public's exposure to radon by focusing on the greatest health risk, radon in indoor air. The proposal lays out two options for states, either adopt a maximum contaminant level of radon in drinking water or adopt an alternative maximum contaminant level and reduce indoor radon levels through a Multi-Media Mitigation Program (which is more cost-effective). The multi-media mitigation program would require states to set goals for increasing radon resistant new construction in homes/schools and also increasing testing and mitigation of homes during real estate transactions. (Contact: Louise Hill)

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WORKING GROUP COMMITTEES

Indoor Environmental Quality of Schools

B Jed Waldman (JWaldman@dhs.ca.gov)

Committee Report Status. ***LATE BREAKING!*** We received word that *Indoor Environmental Quality in California Schools: An Assessment of Needs and Opportunities* may be approved for release soon! As you may recalled, comments on the committee report were sent to DHS by departmental staff at ARB, CDE, CEC, DGS, DHCD and OEHHA, and the report was re-titled and updated in August 1999. We will try to have the report posted on the web as soon as possible.

Healthy School Legislature. An amended version of Assembly Bill (AB) 1207 was passed in the final days of the 1999 legislative session; but it was vetoed by Governor Davis. The final form of the bill and the Governor's veto message can be found on-line at the State's *LegInfo* web site, e.g., www.leginfo.ca.gov/pub/bill/asm/ab_1201-1250/ab_1207_vt_19991010.html.

In early January 2000, Assemblyman Shelly reintroduced some components of his Healthy School bill by amending AB 1043, a 2-year bill still in the Assembly from last session. The bill passed the Assembly Committee on Environmental Safety and Toxic Material Committee (7-0) and awaits action by the Assembly Appropriations Committee. The current version can be found on-line at *LegInfo.*

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Building Design and Operations

B Leon Alevantis (*LAlevant*@dhs.ca.gov)

Green Team and the Capitol Area East End Project. A *Green Team* consisting of representatives from CIWMB, CEC, ARB, and DHS reviewed the proposals submitted by six design/build firms for Blocks 171-174 and Block 225. The firms were scored and ranked based on sustainability, recyclability, energy efficiency, and indoor air quality. The team met with the DGS review team and agreed on a consensus scoring which was presented to the Selection Committee. The Green Team was allowed to brief the selection committee before the interviews with the competing design/build firms. Selected Green Team members participated as observers during the interview and deliberation process. The selection of the two successful firms was announced in December. The Green Team has written an oversight document which describes the involvement of the team during the change order process, design, and construction of the East End Project. This document is now being reviewed by DGS.

Green Building Taskforce. The Taskforce has finalized the text for the Charter and Interagency Agreements. The following Agencies are involved: State and Consumer Affairs, Environmental Protection, Health and Human Services, and Resources. The Departments involved are: CIWMB, CEC, DHS, ARB, DGS, DOF, DWR, and OEHHA. Various goals have been established and lead persons have been assigned. A February 1, 2000 signature date is anticipated by all the Departments and Agencies involved. Secretary Adams is planning a signing ceremony in front of the State Capitol.

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FUTURE MEETINGS

Upcoming meetings of the CIWG-IAQ are scheduled as follows:

- March 8, 2000, CARB Headquarters, 2020 L Street, Sacramento
- June 7, 2000, TBA
- September 13, 2000, TBA
- December 6, 2000, TBA

MEMBERS PRESENT/AFFILIATIONS

Ellen Aasletten / CA Dept. of Ed.
Leon Alevantis / CA DHS IAQ Program
Mike Apte / LBNL Indoor Environment Department
Larry Bellani / CA DGS Real Estate & Design Services
Rachel Broadwin / OEHHA ATES
Regina Colbert / SF Unified School District
Jim Cone / CA DHS Occ. Health Branch
Ken Dudash / San Bernandino Co. Supt. of Schools
Ed Faeder / SRF Environ. & Health Mgmt. / Inc.
John Feliz / CA DGS Real Estate & Design Services
Nancy Hughett / CARB IAQPEP
Steve Hui / CARB IAQPEP
Liz Katz / CA DHS Occ. Health Branch
Rick Kreutzer / CA DHS Environ. Health Investigation

Richard Lam / OEHHA ATES
Jim Lim / Cal/OSHA
Kate MacGregor / UCBerkeley SPH
Janet Macher / CA DHS IAQ Program
Sandra McNeel / CA DHS Environ. Health Investigation
Raymond Neutra / CA DHS Environ. & Occup. Disease Control
Tom Phillips / CARB IAQPEP
Shelly Rosenblum / U.S. EPA Region IX
Zev Ross / Environmental Working Group
Mike Rothenberg / BAAQMD
Rajinder Sandhu / Dept. of Consumer Affairs
David Shearer / ATC,, Inc.
Dorothy Shimer / CARB IAQPEP
Sharon Seidel / CA DHS Environ. Health Investigation
Barbara Spark / U.S. EPA Region IX
Maury Tiernan / Geary Pacific Corp
Miriam Valesco / Environmental Microbiology Lab
Michael Van Loy / Electric Power Research Institute
Ben Venktash / Marina Mechanical Inc.
Jed Waldman / CA DHS IAQ Program

Jed Waldman chaired the meeting, which lasted from 10 am to 12:30 pm

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Attachment

Project Summaries
Lawrence Berkeley National Laboratory / Indoor Environments Program

VOCs and Indoor CO_2 Concentrations in Office Buildings. Analyses of the U.S.EPA BASE study data (28 office buildings) have indicated statistically significant increases in the risk of mucous membrane (MM) and lower respiratory (Lresp) SBS symptoms associated with groups of correlated VOCs. These groups, identified through Principal Components Analysis, are thought to represent particular sources of indoor VOCs. Initial source identification suggests that the relevant sources are those that are frequently replenished in buildings such as photocopiers, automobile exhaust brought indoors via ventilation, paint, and environmental tobacco smoke. Multivariate regression analysis of indoor CO_2 concentrations and these SBS symptoms in 41 BASE study office buildings were conducted. Statistically significant increases in risk of MM and Lresp SBS symptoms were observed with increases in indoor CO_2. In these analyses CO_2 is thought to be an indicator of building occupancy and ventilation, and not a direct cause of the SBS symptoms. Workday average indoor CO_2 concentrations ranged from about 400 to 800 ppm. The findings imply that SBS symptom reductions of up to 70-85% may be achievable through increasing ventilation rates in typical office buildings, even when the existing average indoor CO_2 levels are less than approximately 800 ppm. Funded by U.S. DOE, Office of Building Technologies. (Joan Daisey, JMDaisey@lbl.gov and Mike Apte, MGApte@lbl.gov)

Vapor-Phase Organics in ETS: Dynamics and Exposure. LBNL, in collaboration with the UCB Civil Engineering, has completed the first year of a three year project to characterize ETS exposure in realistic home conditions. This project examines emissions and dynamic characteristics of a wide range of VOCs found in environmental tobacco smoke. (Funded by the California Tobacco Related Disease Research Program [TRDRP]; Joan Daisey, JMDaisey@lbl.gov and Mike Apte, MGApte@lbl.gov)

Further Characterization Studies of ETS. Now on the third year of this project, LBNL will conduct field experiments on the effectiveness nicotine and particle phase ETS tracers for measuring ETS exposure. These experiments will be conducted in homes of participants undergoing a smoking intervention, through collaboration with smoking cessation groups sponsored by the City of Berkeley Tobacco Control Program. The purpose of the experiments is to verify the findings from ongoing studies in a multi-room environmental chamber where the dynamic behaviors of nicotine and ETS particles have been observed to be very different. Improved understanding of the behavior of ETS tracers may lead to more accurate ETS exposure assessment. (Funded by TRDRP; Richard Sextro, RGSextra@lbl.gov and Mike Apte, MGApte@lbl.gov)

ETS Control in Smoking Rooms. LBNL and The California Department of Health Services will soon initiate a collaborative study of the performance of smoking rooms. Laboratory experiments, field studies, and modeling will be employed to determine how the rate of tobacco smoke transport to the non-smoking area is influenced by the design, operation, and use of the smoking room. (Funded by TRDRP; William Fisk, wjfisk@lbl.gov)

IAQ, Productivity and Health. LBNL is collaborating with the Center for the Built Environment at UC Berkeley in a blinded experimental study of the relationship between building ventilation rates and worker performance. This study will be performed in a call center with work performance based on statistical analyses of telephone call data. In collaboration with Helsinki University of Technology (HUT) and NIOSH, LBNL's IED has completed a critical review of the associations of building ventilation rates with health outcomes and perceived air quality experienced by occupants of commercial and institutional buildings. The paper will be published in the next issue of Indoor Air. HUT and LBNL are also undertaking a review of the association of HVAC type and features with health outcomes and perceived air quality. For an article in *Annual Review of Energy and Environment*, LBNL is updating a previous analyses of the nationwide health and productivity gains potentially attainable from improving indoor environments. For an article in *Annual Review of Energy and Environment*, LBNL is updating a previous analyses of the nationwide health and productivity gains potentially attainable from improving indoor environments. (William Fisk, wjfisk@lbl.gov)

High Efficiency Filtration, Enhanced Surface Cleaning and SBS. LBNL and NIOSH have completed a double-blind, controlled, intervention study in a large office building to assess the influence of high efficiency filtration and enhanced surface cleaning on SBS symptoms. Technical papers are being prepared describing the associations of the interventions and air temperatures with symptoms. An assessment of the measured and modeled reductions in airborne particles from high efficiency filtration has been completed and will be published in *Aerosol Science and Technology*. (William Fisk, wjfisk@lbl.gov)

Air Cleaning. LBNL is estimating the reductions in indoor concentrations of particles, from various sources, that result when a variety of air cleaning measures are employed, and is characterizing the associated costs and energy consumption. This work is based on analyses of existing data and modeling. The sources of particles considered are outdoor air (fine mode particles), dust mites, cats, environmental tobacco smoke, and droplet nuclei from coughs and sneezes. The particle air cleaning options include filtration, with various filter efficiency ratings, and electronic air cleaning. Air-cleaning equipment installed within HVAC systems and stand-alone devices will be evaluated. (William Fisk, wjfisk@lbl.gov)

Air Supply Study. Starting in mid 2000, LBNL will initiate a new research effort on methods of monitoring and controlling rates of outside air supply by air handling systems. Current data and research experience demonstrate that the common methods of measuring and controlling the rate of outside air supply by air handlers are often inadequate. A long-range plan for research on this topic is under development. (William Fisk, wjfisk@lbl.gov)

Breathing Zone Ventilation. LBNL in collaboration with the Center for Environmental Design Research at U.C. Berkeley, has conducted a series of studies of task-ambient conditioning (TAC) systems which supply outside air near the worker's breathing zone and enable occupants to adjust their local thermal environment. UCB staff investigate thermal comfort performance and LBNL staff evaluate the influence of TAC systems on effective ventilation rates and pollutant concentrations at the breathing zone. Starting in mid 2000, a new set of experiments, complemented by CFD modeling, will explore means of optimizing ventilation performance of TAC systems. (William Fisk, wjfisk@lbl.gov).

Advanced HVAC Technologies in Classrooms. Starting approximately March 2000, LBNL will initiate a three year project to evaluate and demonstrate the simultaneous energy savings and improvements in indoor environmental quality attained from advanced HVAC technologies and VOC source control. The study will take place in relocatable classrooms. The benefits of advanced HVAC technologies will be assessed using a within-classroom experimental protocol that minimizes confounding. The benefits of VOC source control measures will be based on comparisons of data from classrooms with and without the measures implemented. (William Fisk, wjfisk@lbl.gov)

Air flow and Pollutant Dispersion in Large Indoor Spaces. We are using infrared laser remote sensing and computed tomography to determine tracer gas dispersion maps in a large indoor space (7m by 9m by 11m high). We are also reproducing some of these tracer release scenarios in table-top scale model experiments using water as the working fluid, using fluorescene as a tracer, a sheet of argon laser light to illuminate the dye, and a linear digital video camera quantify the fluorescence. We are using computational fluid dynamic simulations to predict the air flow and tracer dispersion and comparing our predictions with experimental data. The objective of the project is to understand and improve CFD predictive methods for pollutant transport dispersion in large indoor spaces in the presence of mechanical ventilation and natural convection. (Ashok Gadgil, AJGadgil@lbl.gov)

Air flow and Pollutant Transport in MultiZone Buildings. In this project we are improving the existing multizone airflow model (COMIS) to increase its speed of convergence, remove existing bugs in the software, and extend its capabilities. In addition, our near term goal is to incorporate into this model a model of indoor aerosol dynamics (MIAQ4). In the longer term, we will enhance the model capabilities to handle aerosol and gaseous pollutant transport and loss mechanisms in HVAC ducts, sorption and desorption of pollutants on indoor surfaces, improved treatment of air and pollutant flow through stairwells and elevator shafts, and several other features. (Ashok Gadgil, AJGadgil@lbl.gov)

Improving The Performance Of Air Handlers In Large Commercial Buildings. We have been monitoring the performance of the air handlers in the San Francisco Federal building and have developed diagnostic and simulation tools to remotely optimize the energy efficiency of these systems. (Work supported by the U.S. Department of Energy, Federal Energy Management Program. Ashok Gadgil, AJGadgil@lbl.gov)

Guide to Energy Efficient Ventilation in Apartment Buildings. We recently completed a guide that looks at health, comfort and energy issues related to ventilation in multifamily buildings. (Work supported by the US Department of Energy, Rebuild America Program. Ashok Gadgil, AJGadgil@lbl.gov)

Standard 62. Work to support ASHRAE Ventilation standards. Max Sherman serves as a member of SSPC 62.1 (non-residential) and as chair of SPC 62.2 (Residential Ventilation). 62.2 has a completed draft, which is waiting ASHRAE approval for public review. (Max Sherman, MHSherman@lbl.gov)

Infiltration Heat Recovery. Using CFD approaches combined heat and mass transport is simulated for opaque parts of the building envelope to determine whether the energy impacts of infiltration are as much as generally thought. (Max Sherman, MHSherman@lbl.gov)

Residential Commissioning. We are assisting the State of CA in developing diagnostics and metrics suitable for commissioning new and existing homes. This work has supported and will support changes to CA Title 24 in the areas of ventilation, infiltration and ducts. (Max Sherman, MHSherman@lbl.gov)

National Committees. William Fisk is a representative on the National Occupational Research Agenda (NORA) Indoor Environment Team established by NIOSH. This multi-disciplinary team is developing a paper on the highest priority research needs related to health and IEQ in non-industrial work places. In addition, William Fisk is serving on the National Academy of Sciences, Institute of Medicine's *Committee on Asthma and Indoor Air Quality* and is preparing an assessment of the relationship of building ventilation and air cleaning with asthma outcomes.

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